

SPECIFICATIONS INDEX

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR

PHASE II RENOVATION AT 19A – 20 KONGENS GADE

ST. THOMAS, U. S. VIRGIN ISLANDS

DIVISION 15 – PLUMBING

SECTION 15010 – GENERAL PROVISIONS
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1. GENERAL

1.01 RELATED DOCUMENTS:

- A. The requirements of the General, Supplementary and Special Conditions of the Contract Documents and the Drawings are hereby made a part of all Sections of this Division of the Specifications.

1.02 INTENT:

- A. It is the intent of the plans and specifications to provide a complete and operating installation including all obviously necessary items even though items are not indicated on the drawings or in the Specifications.

1.03 DRAWINGS:

- A. The drawings are generally diagrammatic. They do not show every bend, off-set, elbows or other fitting which may be required for installation in the space allocated, or for coordination with other trades.
- B. Drawings are not to be scaled. Unless specific dimensions are shown, the Architectural and/or Structural drawings, and site conditions shall govern exact location of mechanical equipment and appurtenances.

1.04 PERMITS, FEES, TAXES, ETC.:

- A. The Contractor shall secure and pay all permits, State Sales Tax, Federal Excise Tax, royalties, meter and tap fees, and other taxes or fees as required for installation of a complete system as outlined herein and as shown on the plans. The Contractor shall secure all necessary licenses and insurance.

1.05 CONSTRUCTION RESPONSIBILITY:

- A. Specifications are sectionalized for convenience only and do not attempt to define divisions of construction responsibility.

1.06 SUBMITTALS:

- A. Submittal Data: Six (6) sets of shop drawings and/or manufacturers submittal data shall be placed in hardback, three ring binders, tabbed and indexed for reference. Index shall indicate the tab number, item, and section of Specification. No equipment shall be released for manufacture or shipment until submittals are reviewed.
- B. Contractor Review: The Contractor shall check and approve the shop drawings prior to submission. This approval shall include verification of field measurements, field construction criteria, materials, catalogue number and complete identification, including any "mark" used on the drawings. All options specified shall be clearly indicated on submittal, and marked "provided".
- C. Engineer Review: Shop Drawings will be reviewed by the Engineer two times for general conformance with the design concept and contract documents. Additional reviews required by the Engineer shall be charged to the Contractor at the rate of \$80.00 per hour.
 - 1. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures there from. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities, job conditions and dimensions, for selecting fabrication processes, for techniques of assembly and construction; for performing his work in a safe manner.

SECTION 15010 – GENERAL PROVISIONS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

1.07 AS-BUILT DRAWINGS AND EQUIPMENT DATA:

- A. This Contractor shall maintain two complete sets of reproducible sepias for indicating all changes in layouts. Colored pen shall be used for marking such changes at the time of their execution. All underground items shall be dimensioned from visible reference points. The sepias shall be returned to the Owner's Representative prior to final payment.
- B. Maintenance File: Provide the Owner with two (2) sets of Operating and Maintenance Instructions, Parts Lists, etc. on all equipment, as outlined in Part 3 of this Section, including submittal data as approved. Mark all data, etc with local supplier's or representative's name and mount in two (2) hardback three (3) ring binders.

1.08 BASIS OF BIDS:

- A. Specified Products or Equipment: Products are generally specified by manufacturer's name and model or trade name. When specified only by referenced standard (such as ASTM numbers, etc.), the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed.

When only one product and manufacturer is specified with the words 'or equal', this is the basis of quality that alternate manufacturers must meet or exceed in performance. If the words 'or equal' do not appear with the listed manufacturer, this is the basis of the Contract without substitution or exception.

- B. Substitution requests will be considered no later than ten (10) days prior to Bid Date. A formal request for the substitution of products in place of those specified will be considered, under the following conditions:
 - 1. The request is accompanied by complete data on the proposed substitution substantiating compliance with the Contract Documents including product identification and description, performance and test data, references and samples where applicable, and an itemized comparison of the proposed substitution with the products specified or named by Addenda, with data relating to Contract time schedule, design and artistic effect where applicable, and its relationship to separate contracts.
 - 2. The request is accompanied by accurate cost data on the proposed substitution in comparison with the product specified, whether or not modification of the Contract Sum is to be a consideration. If redesign by the Architect or his Consultants is required to accommodate an alternate product or system, all costs of this redesign shall be born by the Contractor requesting the change, at an agreed rate. If additional work is required of other contractors to accommodate an alternate product or system, all additional costs of this work shall be borne by the Contractor requesting the change.
 - 3. The request shall be accepted or rejected solely at the discretion of the Architect/ Engineer. Approved substitution will be addressed in the form of an Addenda.

1.09 GUARANTEE:

- A. The Contractor shall provide a guarantee against defective workmanship, materials or equipment for a period of one year from the date of acceptance. This guarantee shall include all costs encountered in the replacing of defective work or materials, without additional cost to the Owner.
 - 1. In the event the Contractor fails to take action to correct any such defect within 24 hours after receipt of written notice, the work of correcting such defect may be accomplished by the Owner and the Contractor shall be liable for the cost of this work.
 - 2. The Contractor shall convey to the Owner any additional guarantees or warranties provided by the manufacturer of an individual item of equipment or material.

SECTION 15010 – GENERAL PROVISIONS
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

3. Inspection and acceptance of the facility by the Owner or his representative does not relieve the Contractor from compliance with the above guarantee.
4. All material and equipment shall be guaranteed to meet all conditions in manufacturer's data which was current at time of design.
5. The Contractor shall replace all refrigerant lost due to defective workmanship, materials or equipment.
6. The Contractor shall guarantee the systems to operate without undue vibration, pulsation, or objectionable noise and shall provide reinforcement, isolations, insulation and adjustment should such conditions be found to exist after the system has been put into operation. Whether or not a noise is objectionable shall be decided by the Owner's Representative.

1.10 SERVICE:

- A. The Contractor shall provide full service for a period of 90 days from date of acceptance. This includes air conditioning filters.
- B. The Contractor shall arrange for start-up procedures and training for a minimum of 32 hours of Owner's Personnel in the operation and service of all mechanical systems. Time shall be divided into 16 hours for system operation and 16 hours for maintenance.

1.11 OWNERSHIP OF DOCUMENTS:

- A. These Mechanical Plans and Specifications were prepared for use on this project and are for use on this project exclusively. Hernandez Consulting Engineers, Inc. reserves all rights to these Mechanical Plans and Specifications and the use of these documents for any additions to or duplications of this project or for any purpose other than use on this project is strictly prohibited.

PART 2. PRODUCTS

2.01 EQUIPMENT AND MATERIALS:

- A. General: All items of equipment and materials indicated on the drawings and/or specified in these Specifications shall be furnished by the Contractor unless specifically designated as "Existing". "N.I.C." (Not In Contract), or "By Owner". All items of equipment and material shall be installed by the Contractor unless otherwise specifically noted on the Drawings or in the Specifications. All equipment and materials shall fit the allocated space and shall leave reasonable access room for servicing and repairs.
- B. New Equipment and Materials: All equipment and materials used in this installation shall be new, of equal or better quality as specified herein, or as shown on drawings, of domestic manufacture, and unless otherwise noted, shall be standard catalog items of the various manufacturers. All materials shall bear the label of the Underwriter's Laboratory for the intended use or shall be materials approved by the Code Enforcing Authority having jurisdiction.
- C. Existing Equipment and Materials: Equipment removed during the execution of this Contract, and not reinstalled, shall remain the property of the Owner and shall be sorted and stored on the Site or otherwise. Dispose of as directed by the Owner's Representative. All equipment which is re-installed shall be thoroughly steam cleaned, all grease and rust removed, and all surfaces other than copper and aluminum shall be painted, and generally completely reconditioned; new parts which may be required will be furnished by the Owner.

2.02 MATERIAL PROTECTION:

- A. Store and protect all materials from injury prior to installation. Materials shall not be stored on the ground or floor

SECTION 15010 – GENERAL PROVISIONS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR PHASE II RENOVATION AT 19A – 20 KONGENS GADE ST. THOMAS, U. S. VIRGIN ISLANDS

and shall be kept as clean and dry as possible and free from damage or deteriorating elements. Damaged materials shall not be installed.

2.03 AIR CONDITIONING EQUIPMENT REFRIGERANT REMOVAL:

- A. The scope of work for this project may include the removal of air conditioning equipment containing CFC or HCFC based refrigerants. Venting of these refrigerants to the atmosphere is prohibited.
- B. Contractor shall be responsible for the removal of the refrigerants prior to commencing any demolition work. This shall prevent the accidental rupture of any pipe or vessel by the work of other trades.
- C. Contractor shall follow EPA regulations and recommended procedures by recognized trade associations such as ARI and RACCA. Submit copy of procedures before commencing work.
- D. Refrigerants shall be stored in DOE approved pressure vessels and shall be properly labeled. All vessels shall be ASME stamped for the allowed pressure.
- E. Storing of different types of refrigerants in same container is prohibited.
- F. Contractor shall provide, upon request, proof of their qualifications and any other required government certifications as to their ability to perform these services.
- G. Containers with removed refrigerant shall be removed from the Site by the Contractor, and delivered to a reprocessing facility.

PART 3. EXECUTION

3.01 INSTALLATION:

- A. Prior to commencement of work, verify measurements at building site. Submit discrepancies and differences to Architect/Engineer for consideration and decision before proceeding.
- B. Obtain full information regarding peculiarities and limitations of space available for installation of the equipment and materials under contract, and provide ready accessibility to dampers, valves and other apparatus, including any part of system required to be reached for maintenance or operation.
- C. Provide accurate layout, grades and elevations; set sleeves and openings in ample time; take proper precautions to protect work and equipment from damage. Provide all necessary supports required for the safe and proper installation of mechanical equipment.
- D. Cut all openings and chases required to accommodate the work under this Division, and repair all floors, walls, etc., damaged by such cuttings. All work done under this heading must conform in every respect to finish and quality of materials and workmanship specified under appropriate Sections for the building.
- E. Do all trenching, excavating and backfilling necessary to accommodate the work under this Division. Trench widths to be adequate to permit installation, allowing a minimum of eight inches clearance on each side of pipe. Bottom of trench to be tamped firm and evenly graded to provide specified pitch. Sheath and brace trenches and excavations. After testing and inspection, backfill with clean earth, carefully tamping each nine inch layer. Backfilling and removal of any sheathing and bracing to be done without disturbing installed piping. All trenching shall be in accordance with, and comply with, the Trench Safety Act "SB 2626".

SECTION 15010 – GENERAL PROVISIONS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR PHASE II RENOVATION AT 19A – 20 KONGENS GADE ST. THOMAS, U. S. VIRGIN ISLANDS

- F. Perform all required tests in presence of representative of Architect/Engineer and any authority having jurisdiction. Give 48 hours notice prior to test.
- G. Insure compliance at all times of all employees with requirements of safety codes and of all local codes and ordinances applicable to performances of work under this Division.
- H. The Contractor shall be responsible for the full coordination of this work with that of all other trades.
- I. In connecting into existing systems, the Contractor shall exercise care and caution in removing work (piping, ductwork, insulation, equipment, etc.), and shall remove, damage or destroy only that portion of such work as is necessary to accomplish the work. Repair and/or replacement of unnecessarily damaged or removed work shall be accomplished by the Contractor, at no additional cost.

3.02 COORDINATION OF OTHER TRADES:

- A. Field painting of exposed piping, ducts, hangers and supports is specified in Painting Section of Specification. Clean all surfaces free of grease, scale, rust and other foreign matter, and prepare for painting. Touch-up all factory finishes marred in construction with factory touch-up kits.
- B. Provide starters for all motors specified under this Division, unless otherwise indicated on plans or herein.
- C. Provide all control items required and furnish wiring diagrams for all such equipment.
- D. All electrical items furnished must conform to the requirements of Division 16.

3.03 OBSERVATION AND INSPECTION OF THE WORK:

- A. The work will be periodically observed by the Architect/Engineer/Owner during the course of construction. The Contractor shall provide for all inspections by authorities having jurisdiction during the proper phase. Furnish certificate, or certificates of final approval by authorities having jurisdiction at time of final inspection.

3.04 WORKMANSHIP:

- A. All work shall be performed by workers skilled in their respective trades and all materials and equipment shall be installed in accordance with manufacturer's recommendations.
 - 1. Supervision: The Contractor shall be responsible for compliance with all laws and ordinances governing the work. The Contractor's Superintendent shall coordinate the work of all trades, and shall program deliveries and work schedules. Each trade within Division 15 shall have a full time supervisor on the jobsite for the duration of the project.
The Supervisor shall be a Licensed Journeyman Mechanic, or hold a Certificate of Competency in the respective trade.
- B. Execute all work in a safe, neat and workmanlike manner.
- C. Where special qualifications are required, i.e. for welders, brazers, etc., a currently active certificate of qualification from a recognized testing laboratory and dated within the twelve months prior to performance of the work will be required. If the workmanship of any such specially qualified worker creates reasonable doubt as to skill, the Architect/ Engineer may require the worker to be re-certified.

3.05 CONTINUITY OF SERVICES:

SECTION 15010 – GENERAL PROVISIONS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR PHASE II RENOVATION AT 19A – 20 KONGENS GADE ST. THOMAS, U. S. VIRGIN ISLANDS

- A. Interruption of existing facilities or services shall be kept to a minimum and the Contractor shall furnish all materials and labor required whenever temporary connections are necessary to maintain continuity of service. Interruption of existing services, the installation of temporary facilities, and the work of making final connections to new work shall be done only at such times as permitted and scheduled by the Owner. All such connections and tie-ins shall be coordinated through the owner's Representative.
 - 1. The duration of each shutdown shall be limited to nights and/or weekends with the time frame for shutdown as specified by the Owner. The Contractor shall notify the Owner in writing forty-eight (48) hours in advance of each required interruption of existing services.
 - 2. The Contractor shall include in his bid price all premium time charges for labor and equipment required for all night and weekend overtime work, as necessary, to complete the scope of the Contract.

3.06 OPERATING AND MAINTENANCE MANUALS:

- A. Operating and Maintenance Manual instructions shall be provided for all mechanical equipment and systems, as hereinafter specified.
- B. Operating and Maintenance Manuals shall be used for training of and use by the Owner's operating personnel, in the operation and maintenance of the Mechanical System.
 - 1. The Manuals shall address equipment and operation of the systems. Furnish Manuals as indicated hereinafter.
- C. Format of the Manuals shall be arranged in separate Sections for each class of system as follows:
 - 1. Air Conditioning, Heating and Ventilating Systems.
 - 2. Control Systems
 - 3. Plumbing.
 - 4. Fire Protection
- D. Content of each Section of the Manuals shall include, but shall not be limited to, the following:
 - 1. Description of System.
 - 2. Operating Sequence and Procedure.
 - a. Step-by-step procedure for system startup, including a pre-start checklist. Refer to controls and indicators by nomenclature consistent with that used on panels and in control diagrams.
 - b. Detail instruction in proper sequence, for each mode of operation (i.e., day-night staging of equipment).
 - c. Emergency Operation: If some function of the equipment can be operated while other functions are disabled, give instructions for operations under these conditions. Include here only those alternate methods of operations (from normal) which the operator can follow when there is a partial failure of malfunctioning of components, or other unusual condition.
 - d. Shutdown Procedures: Include instructions for stopping and securing the equipment after operation. If a particular sequence is required, give step-by-step instructions in that order.
 - 3. Maintenance instructions and requirements shall be divided into two primary categories: Preventive maintenance and corrective maintenance.
 - 4. Preventive Maintenance:
 - a. Provide a schedule for preventive maintenance. State in tabular form the recommended frequency of performance for each preventive maintenance task. Cleaning, inspection and scheduled overhauls.
 - b. Cleaning: Provide instructions and schedules for all routine cleaning and inspection with recommended lubricants.
 - c. Inspection: If periodic inspection of equipment is required for operation, cleaning or other reasons, indicate the items to be inspected and give the inspection criteria for: Motors, controls, filters and any other

SECTION 15010 – GENERAL PROVISIONS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

- maintenance item.
 - d. Provide instructions for minor repairs or adjustments required for preventive maintenance routines. Identify test points and give values or ranges for each.
5. Corrective Maintenance:
- a. Corrective maintenance and troubleshooting instructions shall be predicated upon a logical effect-to-cause checklist and replacement procedure to minimize equipment downtime.
 - b. Troubleshooting tables, charts, or diagrams shall be used to present specified procedures. A guide to this outline shall be a three column chart entitled:
Malfunction, Probable Cause and Recommended Action.
 - c. Repair and Replacement: Indicate repair and replacement procedures most likely to be required in the maintenance of the equipment.
 - d. Safety Precautions: This Subsection shall comprise a listing of safety precautions and instructions to be followed before, during and after making repairs, adjustments or routine maintenance.
6. Manufacturers' Brochures: This Subsection shall include manufacturers' descriptive literature covering devices and equipment used in the system, together with illustrations, exploded views and renewal parts lists. Manufacturers' standard brochures shall be corrected so that information applying to the actual installed equipment is clearly defined.
7. Spare Parts:
- a. Provide list of spare parts as recommended by equipment manufacturer for each major piece of mechanical equipment.

END OF SECTION

SECTION 15023 – CODES AND STANDARDS
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1 GENERAL

1.01 GENERAL:

- A. Latest editions with current revisions and amendments of the following codes and standards are considered minimum requirements for materials, workmanship, and safety where not covered elsewhere in these specifications.

1.02 CODES AND STANDARDS:

- A. Building Code(s) having Jurisdiction:
 - 1. Standard Mechanical Code, 1999 Edition
- B. SMACNA - HVAC Metal Duct Standards
- C. ANSI/ASHRAE 15-1978 - Safety Code for Mechanical Refrigeration
- D. ASTM - American Society for Testing and Materials
- E. U.L. - Underwriters' Laboratories Listed
- F. NEMA - National Electrical Manufacturer's Association
- G. ANSI - American National Standards Institute
- H. NFPA No. 90A - Air Conditioning and Ventilation
- I. NFPA No. 101 - Life Safety Code

1.03 LABELING:

- A. Where it is required in other Sections of this Division that a product be "U.L. Listed", it shall be interpreted to mean that each such product shall bear the U.L. Label.
- B. This requirement shall apply to other standards, which provide "Labels" for products, which signifies "Approval" (i.e. NSF, SMACNA, PDI, etc.).

PART 2. PRODUCTS/NOT USED

PART 3. EXECUTION/NOT USED

END OF SECTION

SECTION 15044 – GENERAL COMPLETION
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1. GENERAL

1.1 GENERAL:

- A. As a prerequisite to final inspection, all construction, testing, adjustments, balancing, start up and any required instruction periods will have been completed on all mechanical systems and equipment.
- B. Control systems and automatic alarm systems shall have been calibrated and adjusted as required and manufacturer's written verification shall be presented to the Architect/Engineer.

PART 2. PRODUCTS/NOT USED

PART 3. EXECUTION

3.1 AIR CONDITIONING:

- A. Ductwork shall be installed complete including all required dampers, hangers, insulation, diffuser, register, VAV terminals, etc.
- B. All piping shall be complete including finishing piping, identification of piping and valves, and flushing and chemical treatment of system.
- C. All equipment shall be leveled.
- D. All control system components shall be installed and tested for function.
- E. All system testing and balancing shall be complete.
- F. Mount Wiring Diagrams and Operating Instructions, framed under glass, and mounted in all Main Equipment Rooms.
- G. Submit all Operating Instructions, Manuals, Reports and Maintenance Manuals to Owner, in a hardback three ring binder.
- H. Submit completed Record Drawing Reproducibles
- I. Owner's personnel shall receive a complete operation training for a minimum of 32 hours. Submit Certificate signed by owner that the training has been provided to the Owner's satisfaction.

3.2 PLUMBING:

- A. All plumbing systems shall be installed complete and all tests as required in other sections of the specification as related to the plumbing systems or as required by the latest edition of the Applicable Plumbing Code shall be completed.
- B. Plumbing fixtures shall be tested for proper operation and all flush valves adjusted. Grout fixtures where they connect to wall or floor.
- C. Piping leak tests and correction of defects shall be complete. Piping identification markers shall be

SECTION 15044 – GENERAL COMPLETION

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

installed as required and all valve charts, operating instructions, and other data required for posting shall be in place.

- D. A final bacteriological test of the potable water system shall be made by a laboratory approved by the Local Health Department and delivered to the Architect/Owner at the time of final inspection.
- E. Submit complete Record Drawing Reproducibles.
- F. Submit Bound Operating Instructions, Maintenance Manuals, Guarantee Certificates and Reports.

3.3 FIRE PROTECTION:

- A. All Fire Protection piping shall be complete, including identification of all piping and valves, flushing and pressure testing in accordance with NFPA-13.
- B. The Fire Pump and Jockey Pump shall be installed, level, and tested in accordance with NFPA-20. Control panels shall be interfaced with the Fire Alarm System.
- C. All Control Valve Tamper Switches and Flow Switches shall be installed, operational and interfaced with the Fire Alarm System.
- D. All Hydraulic Nameplates, Sprinkler Head Cabinets with spare heads and wrench shall be installed.
- E. All Sprinkler Heads shall be installed. Escutcheons and concealed head cover plates shall be adjusted for a flush fit to the ceiling or wall, as applicable.
- F. Submit all Operating Instructions, Test Certificates, and a copy of NFPA-13A in a hardback three ring binder to the Owner.
- G. Submit Completed and dimensioned record drawing reproducibles.

END OF SECTION

SECTION 15047 – IDENTIFICATION

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01.1 SUBMITTALS:

- A. manufacturer's data for approval review before any work is commenced.

PART 2.PRODUCTS

2.01 PIPING IDENTIFICATION:

- A. All pipe 1 inch in diameter or larger, exposed or concealed, in accessible pipe spaces and ceilings shall be provided with color bands, legend, and flow arrows in accordance with ANSI A13.1-1981.
- B. Identification markings shall be laminated plastic appropriately color coded with a clearly printed legend to identify the pipe contents. Size of letters shall be proportional to pipe size in accordance with ANSI A13.1-85. Pipe markers shall be "Set-Mark" type, snap in place markers as manufactured by Seton Name Plate Corporation.
- C. Piping 3/4 inch and smaller shall be provided with 1-1/2 inch diameter brass identification tags indicating the product in 1/4 inch depressed black filled letters.
- D. Markings shall be installed at each valve, at each branch or riser take-off, at each equipment connection, where pipes pass to underground, and on all horizontal piping at 20 foot intervals.

2.02 PIPE COLOR CODING:

- A. Identify new and existing piping with both markers and directional arrows in accordance with the following color coding system.

WORDING	PIPE COLOR	MARKER COLOR
Domestic Cold Water	Light Green	Green
Domestic Hot Water Supply	Yellow	Yellow
Domestic Hot Water Return	Yellow	Yellow
Refrigerant Suction	Yellow	Yellow
Refrigerant Hot Gas	Yellow	Yellow
Fire Protection Water	Red	Red
Storm Drain	Green	Green
Plumbing Vent	Green	Green
Storm Drain	Green	Green
Plumbing Vent	Green	Green
Sanitary/Waste	Green	Green
Condensate Drain	Green	Green

2.03 VALVE IDENTIFICATION:

- A. All valves in each system shall be identified by system and number with 1-1/2" diameter brass valve tags. Each tag shall be engraved with black wording or abbreviations to indicate the line service and whether normally open (N.O.) or normally closed (N.C.) or balancing as applicable. All letter coding shall be approved by the Architect/Engineer and Owner.

SECTION 15047 – IDENTIFICATION

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

2.04 EQUIPMENT IDENTIFICATION:

- A. All equipment shall be identified with the same designation given on the drawings. Identification shall be with engraved plastic name plates using 1 inch letters on equipment having cabinets and with appropriate size brass tags where cabinets do not exist.
- B. The following shall receive name-plates of minimum 1" X 2-1/2" size:
 - 1. Pilot Lights
 - 2. Panel mounted gauges, instruments and meters
 - 3. Motor Controllers
 - 4. Switches and Pushbuttons
 - 5. Motor Starters and Disconnects
- C. The following shall receive name plates of a minimum 2" X 4" size:
 - 1. Air Handling Units
 - 2. Fans
 - 3. Pumps
 - 4. Condensing Units
 - 5. Rooftop Units
- D. Manufacturer's name Plate: Die stamped or engraved, securely fixed in a conspicuous place. Name-plate shall have the manufacturer's name, address, model number, and equipment rating.

2.04 VALVE TAG NUMBERING:

- A. Nomenclature shall correspond to those used in the preparation of the posted operating and maintenance instructions.
- B. All valves in every system shall be provided with a tag.
- C. Colors and service symbols shall correspond to those used for pipe identification.

PART 3.EXECUTION

3.01INSTALLATION:

- A. Install laminated plastic pipe identification markers in accordance with manufacturer's instructions in locations so as to be easily visible at the normal eye level in the space.
- B. Locate and attach equipment markers as directed by the Architect/Engineer.
- C. Provide accurate Valve Chart at completion of project, framed under glass and mounted in Equipment Room Wall. One valve chart per room.
- D. The use of stick on or paint stenciled piping name tags is not acceptable.

END OF SECTION

SECTION 15051 – MOTORS AND STARTERS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

1.02 SCOPE:

- A. Unless otherwise shown, provide manual or magnetic motor starters and control items for all motors provided under this section of the specifications. Electrical items furnished must conform in all respects to the requirements of Division 16.

PART 2.PRODUCTS

2.01 MOTORS:

- A. Motors: All motors shall be NEMA Standard design, American made, sound rated and shall be grease lubricated ball bearing type. Motors shall be wound for specified voltage. Motors shall have a minimum power factor of 85% to 100% load and a minimum efficiency of 91.7% per IEEE Test Procedure 112, Method B, at 100% load.
- B. Motors 3/4 HP and Larger (unless otherwise noted): 460 or 208 volt, 60 cycle, 3 phase. Motors 1/2 HP or Smaller (unless otherwise noted): 120 volt, 60 cycle, single phase.
- C. Provide slide rails where motors are used with drives requiring adjustment.

2.02 STARTERS:

- A. All Starters for Motors Less Than 1/2 HP (unless otherwise noted): Across-the-line- type with H-O-A switch with thermal overload protection and auxiliary pilot light. Switch shall be NEMA 1 general purpose, flush mount, stainless steel cover, Allen-Bradley Bulletin 609 open type, suitable for mounting on standard electric switch box.
- B. All Starters for 1/2 HP and up (unless otherwise noted): Allen Bradley Bulletin 509 with control circuit transformer, fused CLF primary, overload protection in three phases "on" pilot light, and "hand-off-auto" switch in covers. NEMA-1 enclosures for indoor application and NEMA 3R enclosures for starters exposed to weather, unless otherwise noted and two NO and two NC auxiliary contacts.
- C. Manual Starters for small 3-phase motors, where indicated, Allen-Bradley Bulletin 609 with toggle operator and three (3) overload heaters. NEMA-1 enclosures unless otherwise noted.
- D. Where Allen Bradley numbers are specified, equivalents by Square 'D', General Electric or Furnas are acceptable.
- E. Provide reduced voltage starters as indicated or specified.
- F. All rooftop and exterior mounted equipment shall have weather tight, external mounted disconnects.

2.03 CONTROLS:

- A. Control panels, float switches and other control items (including wiring diagrams) required for proper operation, shall be provided.

PART 3.EXECUTION

SECTION 15051 – MOTORS AND STARTERS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

3.01 INSTALLATION:

- A. Install all equipment in accordance with manufacturer's recommendations.
- B. Each trade to provide concrete pedestals, bases, pads and anchors for equipment and apparatus furnished by them under respective sections. Each trade to provide anchor bolts, slab inserts, supports, cradles, saddles, for motors and starters furnished by them. Provide concrete pads with steel reinforcing and necessary bolts and anchors. Where concrete pad is set directly on concrete floor, provide dowels in floor to tie base to floor unless noted otherwise. Concrete to be in accordance with requirements specified under Concrete Section.

3.02 COORDINATION:

- A. Furnish to the Electrical Contractor, in ample time, electrical characteristics and location of electrical connections for each item of equipment and control.
- B. Furnish approved power and motor control and A/C Control Wiring Diagrams for all systems under this Section. Mount in laminated plastic on solid mounting boards in equipment rooms.

END OF SECTION

SECTION 15400 – PLUMBING

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01.1 SUBMITTALS:

- A. Manufacturer's data and shop drawings for review before any work is commenced.

1.02 PROTECTION:

- A. Take adequate precautions to insure that installed equipment and fixtures are protected from damage during construction.

1.03 ENERGY CODE:

- A. Systems shall comply with the Energy Conservation Code as follows:
 - 1. Water heaters shall bear the ASHRAE Label indicating compliance with Standard 90.
 - 2. All showers shall have 3 GPM (maximum) flow restrictors.
 - 3. All lavatory faucets which provide hot water shall have 1/2 GPM flow restrictor and where necessary, a tempering valve to limit temperature to 110 degrees F.
 - 4. Water heaters shall have heat traps.
 - 5. All Plumbing Fixtures shall comply with Code Table 46-R2, Water Consumption in Plumbing Fixtures.

PART 2.PRODUCTS

2.01 MATERIALS:

- A. Refer to Sections 15410, 15420, and 15430 for basic materials.

2.02 FIXTURES:

- A. Fixtures and trim shall be located as shown on the drawings and as specified in the "Plumbing Fixture Schedule" on the drawings.
- B. Products by the below named manufacturers may be provided in lieu of the specific manufacturer named in the fixture schedule, however, the product must be equal to the named product not only in general quality, but also in specific details of construction and materials. The Engineer may accept or reject such alternates at his discretion.
 - 1. Fixtures: American Standard, Crane, Kohler or Eljer.
 - 2. Stainless Steel Sinks: Just or Elkay.
 - 3. Flush Valves: Sloan, Delaney or Zurn.
 - 4. Seats: Church, Olsonite, Beneke, or Bemis.
 - 5. Trim: Fixture manufacturer, Standard, T & S Brass, Chicago Faucet, Speakman, or as named in "Plumbing Fixture Schedule"..
 - 6. Special Trim: T & S Brass, Chicago Faucet, Speakman.
 - 7. Special Shower Control: Moen, Symmons or Powers.
 - 8. Carriers: Josam, Wade or Zurn.

SECTION 15400 – PLUMBING

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

- 9. Mop Service Sinks: Stern-Williams or Fiat.
- 10. Electric Water Coolers: Oasis, Haws, Sunroc, or Halsey Taylor.
- 11. Water Heaters: A.O. Smith, Lochinvar, Weben, Jarco or Teledyne Laars.

2.03 FLASHING AND SAFING:

- A. Flashing & Pitch Pans: Provide 4# lead vent flashings and 20 oz. copper pitch pans to roofer for installation.

PART 3.EXECUTION

3.01 EQUIPMENT AND FIXTURES INSTALLATION:

- A. Contractor shall provide all necessary material and labor to connect to Plumbing System all Fixtures and equipment having plumbing connections and which are furnished by Owner or specified in other sections of these specifications.
- B. Supply pipes to each item of equipment or fixture (except faucets, flush valves or other control valves which are supplied with an integral stop) shall be equipped with a shut-off valve to enable isolation of item for repair and maintenance without interfering with operation of other equipment or fixtures.
- C. Exposed pipe, fittings, traps, valves, escutcheons, valve handles and accessories, above and below fixture, shall be chrome plated brass.
- D. Water supplies and drainage nipples penetrating wall shall have a chrome plated, cast brass escutcheons, secured with set screws.
- E. Exposed Traps: Chrome Plated, 17-gauge (minimum) with cleanout.
- F. When erecting plated piping, fittings and fixtures, care shall be taken not to mar the finish. Friction wrenches shall be used and no wrench marks shall show on completion.
- G. Anchor Supply Piping At Fixtures. Special attention shall be given to shower arms and flush valves.
- H. Grout fixtures where they come in contact with wall or floor.
- I. Wall mounted lavatory supports shall be steel plates. Carriers shall be bolted down to floor slab.
- J. Closet carriers shall be floor supported, commercial class, "close" type for "No-Hub" pipe.

END OF SECTION

SECTION 15410 – PIPE AND PIPE FITTINGS (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE, ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 SUBMITTALS

- A. Manufacturer's data for review before any work is commenced.

PART 2.PRODUCTS

2.01 PIPE:

- A. The following schedule covers materials unless otherwise specified under the particular system section.

MATERIAL	SERVICES
1. PVC gravity drainage pipe, SDR-35 ASTM D3034	Sanitary & Storm sewer up through 14" diameter.
2. PVC water supply pipe, Schedule 80, ASTM D – 2464	Cold, hot, hot water recirculating potable water.

2.02 FITTINGS (PRESSURE PIPE):

- A. PVC Schedule 80 Fittings: Socket type shall conform to ASTM D-2467, threaded type shall conform to ASTM D-2464.

2.03 FITTINGS (NON PRESSURE):

- A. PVC SDR-35: Push on plastic fitting with elastomeric joints. ASTM D3212.

PART 3.EXECUTION

3.01 GENERAL:

- A. The design drawings are generally diagrammatic. They do not show every bend, offset, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work of this Section with that of Divisions 2 and 16 is necessary to avoid conflicts.
- B. Line and Grade: Install gravity lines at uniform grade to low point after field verification of low point invert.
- C. Furnish and install removable plastic sleeves for all pipes passing through concrete floors and walls. Sleeves for pipes penetrating floors or walls shall be sized for proper safig of annular space between pipe and floor or wall. Annular space between pipe and floor or wall shall be packed with 3-hour fire rated, 'U.L.' Listed resilient sealant, in accordance with local codes. Sealant shall be Dow-Corning Type RTV Silicone Foam Penetration Seal, foamed in place or equivalent. Sealant shall be installed in strict accordance with manufacturer's instructions. Use prime coating as required by manufacturer.
- D. Unions or Flanges: Provide unions or flanges in all service lines at each piece of equipment, especially valves or at other locations required for ready disconnect.
- E. Blocking shall be provided at all ells, tees, caps and changes of direction in mechanical joint pressure pipe. Use non-stress concrete against a minimum of two square feet of undisturbed earth.
- F. Open Ends: Ends of all piping, including those extending above the roofs, drains, water and fixture outlets shall be kept closed during construction with caps or plugs so as to prevent dirt or building materials from entering pipes. Roof drain strainers shall be set in place during construction.
- G. Vertical No-Hub pipe shall be rigidly supported.

SECTION 15410 – PIPE AND PIPE FITTINGS (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE, ST. THOMAS, U. S. VIRGIN ISLANDS

3.02 JOINING PIPE:

- A. Make all joints permanent and water tight.
- B. Joining Threaded Pipe: Ream all pipe after cutting and before threading. Use non-hardening teflon tape or teflon pipe compound on male threads only. No caulking on threaded joints to stop leaks.
- C. Provide nipples of same material and weight as pipe used. Provide extra strong nipples when length of unthreaded part of standard weight nipple is less than 1-1/2".
- D. Provide reducing fittings where changes in pipe sizes occur, no bushings permitted. Use eccentric reducers on pumps, flat side up.
- E. Provide dielectric unions, flanges or nipples between copper and steel piping and between brassware and steel. Do not use steel and copper piping in the same system without such isolation.
- F. Welded piping shall be cleaned free of rust, scale and oxide. Pipe shall be bevelled at each end and. After welding, pipe shall be hammer cleaned and flushed to remove scale, welding slag and other debris. If weld contains any defects, it shall be repaired to satisfaction of Engineer.
- G. Welder shall be qualified as per American Welding Society Requirements. List of welders with date of latest certification shall be available at job site. Safety procedures shall conform to AWS Requirements.
- H. Long radius elbows shall be used for all welded or brazed piping.
- I. Reduction in pipe sizes shall be made with reducers only. Bushings are not permitted. Eccentric reducers shall be used in all horizontal piping and at pump suction. Reducers in water piping shall have flat side up to facilitate venting. Reducers in steam piping shall have the flat side down to facilitate condensate drainage.

3.03 PIPE PROTECTION:

- A. Wrap soil pipe that touches metal or is exposed to plaster with a layer of Visqueen.
- B. Spirally wrap all pipe lines embedded in concrete with two layers of 30 lb. felt.
- C. Provide a continuous strip of "Terra-Tape" in 3" wide red or orange located directly above all buried pipe approximately 12" below grade.
- D. All fuel oil piping shall be encapsulated with PVC secondary containment PVC system.

3.04 TESTS:

- A. All leak tests, as required in other sections of this specification or tests required by the latest edition of the applicable Plumbing Code, shall be completed and witnessed by the Project Engineer prior to any application of insulation, wrapping of pipe or backfilling of pipe in trenches. Contractor shall present a letter of certification indicating completion of such tests signed by an authorized representative of the Contractor.

3.05 PAINTING:

- A. Finish all exposed piping and accessories, including pipes in Equipment Rooms with two coats of rust inhibiting paint. De-rust clean and degrease all surfaces as needed to accept paint. Colors shall be as specified in Section 15047, or as selected by Architect/Engineer.

END OF SECTION

SECTION 15420 – VALVES–PLUMBING
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 QUALITY ASSURANCE:

- A. Manufacturer's data for review before any work is commenced, in accordance with requirements of Division I of these Specifications.
- B. All valves must be manufactured in the USA to ANSI Standards and applicable MSS, and Federal Specifications.

PART 2.PRODUCTS

2.01 VALVES - GENERAL PURPOSE:

- A. Acceptable manufacturers: Milwaukee, Nibco, Stockham. Manufacturer's name and valve rating cast in body.
- B. Minimum Working Pressure: 200 psi, steam (125 SWP/200 CWP).
- C. Valves 3" and Smaller: All B62 bronze, non-rising stem, threaded or soldered ends to conform to ANSI B1.20.1 and ANSI B16.18.
- D. Valves 4" and Larger: Iron body, bronze trimmed, flanged ends, ANSI B16.1.
- E. Provide valves equal to following Milwaukee figure numbers:

3" and Smaller	3" and Smaller	4" and Larger
Screwed	Soldered	Flanged
Gate B-103	B-104	G-119 or G-623
Globe B-29	B-24	-----
Check B-319	B-309	G-928B or G-932B

2.02 VALVES - SPECIAL PURPOSE:

- A. Balancing Cock: DeZurik 400 series or Rockwell.
- B. Stop Valves: Gate valve or as called for with fixture.
- C. Ball Valves: Crane "GEM" #2180 or #2182. Crane "HYDRO" #2190 or #2192 for hot water. For higher pressures up to 600 lbs., Milwaukee BA-100 and BA-150.

PART 3.EXECUTION

3.01 INSTALLATION:

- A. Install valves as recommended by manufacturer.
- B. Install valves so that they are easily accessible for operation, visual inspection and preventive maintenance.

END OF SECTION

SECTION 15430 – PIPING SPECIALTIES (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

PART 2.PRODUCTS

2.01 HANGERS:

- A. Provide hangers, supports and supplementary steel as called for below for the different applications.
- B. Inserts, Hangers, Rods and Clamps: Figure (Fig.) numbers used refer to Grinnell; Number (No.) used refer to Elcen.

1. Inserts:

- a. C.B. Universal concrete insert, Fig. 282
- b. Screw concrete insert, Fig. 152
- c. Wedge type concrete insert, Fig. 281
- d. Wedge stud anchor, No. 208
- e. Self drilling expansion shield, No. 212

2. Hangers: Use adjustable clevis type hangers as called for below:

- a. Cast Iron Pipe: Fig. 590
- b. Copper Tubing: Fig: CT-65
- c. Steel & PVC Pipe : Fig. 260

3. Riser Clamps: Support risers and stacks as follows:

- a. Cast Iron Pipe: At every floor and the base, Fig. 261.
- b. Steel & PVC Pipe: At every floor minimum, Fig. 261.
- c. Copper Pipe: At every floor, Fig. CT-121.
- d. Copper Pipe: Against wall, Fig. 262, copper or copper plated.

4. Rods: Continuous thread, Fig. 146.

a. Horizontal Steel & PVC Piping:

<u>Piping Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/4 inches	3/8 inch	8 feet
1-1/2 inches	3/8 inch	9 feet
2 inches	3/8 inch	10 feet
2-1/2 inches	1/2 inch	11 feet
3 inches	1/2 inch	12 feet
4 and 5 inches	5/8 inch	12 feet

b. Horizontal Copper Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 3/4 inches	3/8 inch	6 feet
1 and 1-1/4 inches	3/8 inch	5 inch
1-1/2 and 2 inches	3/8 inch	8 feet
2-1/2 inches	1/2 inch	9 feet
3 inch	1/2 inch	10 feet
4 inches	1/2 inch	12 feet
6 inch	1/2 inch	14 feet

SECTION 15430 – PIPING SPECIALTIES (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

- c. Horizontal Cast Iron Piping:
- | Pipe Size | Rod Diameter | Maximum Spacing |
|-----------------------|--------------|-----------------|
| Up to 3 inches | 1/2 inch | 5 feet |
| 4 inches | 5/8 inch | 5 feet |
| 6 and 8 inch 3/4 inch | 5 feet | |
- d. Insulation Protection Shield: Grinnell, Fig. 167.

2.02 SPECIALTIES:

- A. Strainers shall be bronze body "Y" Type, minimum 150 PSI W.O.G. working pressure, and shall have stainless steel screens, 20 MESH up to 2" and 1/16 inch perforated for 2-1/2 inch and larger, of sufficient area to provide a maximum pressure drop of 1 psi. Strainers shall be provided with full size blow off connection, complete with ball valve. Strainer shall be Muessco #351 up to 2", and Muessco #851 for sizes 2-1/2 inch and larger, or approved equivalent.
- B. Trap Resealers:
1. For Water Closet Flush Valve: Sloan Valve Company F-72-A or Chicago Faucet, chrome plated with tubing to wall and wall flange.
 2. For Lavatory or Sink Supply: Josam 88250 or J.R. Smith Company. Trap Seal Primer. Mount concealed with access panel.
- C. Water Hammer Arrestors:
1. Josam 75000 or J.R. Smith Company, stainless steel shell, elastomeric bellows. Pressurized argon charge. Size by P.D.I. Standards.
- D. Hose Bibbs:
1. All brass with adjustable packing nut, teflon impregnated packing, loose tee key operator and Nidel 34HF or Watts 8A vacuum breaker (non-removable).
 2. Exterior Wall - Woodford Model 24, brass.
Lawn Faucet - Woodford Model &24, brass
Interior Wall - Woodford Model 24P, polished chrome plated.
Flush - Woodford Model 74, chrome plated.
Recessed - Woodford Model B24, chrome plated.
- E. Pressure and Temperature Relief Valve:
1. ASME adjustable bronze spring and diaphragm type combination pressure and temperature relief, with test lever and automatically reseating thermostatic element. Minimum discharge capacity equal to the input capacity of the heater. Settings: 125 psi pressure and 210 degree F. temperature relief. Watts 30 XL, N240X, Kunckle or Ashton Valve Company.
- F. Vacuum Breakers:
1. Hose Bibb: To be an integral part of hose bibb.
 2. Atmospheric Type: Watts 288A. Chicago Faucets, T & S Brass.
 3. For Plumbing Fixtures: As specified under Plumbing Fixtures (Section 15400).
 4. Heater Vacuum Relief Valve: A.G.A. bronze body, high heat resisting disc, threaded outlet, 150 psi working pressure, Watts No. 36A, Kunckle, or Trane.
- G. Backflow Preventor:
1. Watts 9D or Watts 909 Series or ASSE approved equal.
- H. Unions and Flanges:

SECTION 15430 – PIPING SPECIALTIES (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

1. Steel Pipe: Malleable iron unions with brass seat for 2 inches and smaller. For 2-1/2 inches and larger, use steel flanged connections 150 pound class. Use galvanized unions for galvanized piping.
 2. Copper Pipe: Bronze unions for 2 inches and smaller. For 2-1/2 inches and larger, use bronze flanged connections 150 pound class.
 3. Dielectric Fittings; Unions and flanges shall meet dimensional requirements and tensile strength of pipe unions in accordance with Fed. Spec. WW-U531D and ASME B16.8. Unions or flanges shall be suitable for required operating pressures and temperature conditions. Ends shall be threaded or soldered to match adjacent piping. Metal parts of union or flange shall be insulated to prevent current flow between dissimilar metals. EPCO dielectric pipe fittings, Clear Flow dielectric nipples, approved equal.
- I. Escutcheons: Chrome plated or stainless steel with set screws for holding securely in place. Use escutcheons on pipes passing through walls, floors and ceilings of finished areas. Caulk inside perimeter of escutcheon and secure escutcheon to wall. No annular space permitted between escutcheon and wall.
- J. Automatic Air Relief Valve: Half inch IBBM, 150 psi W.O.G. class, V.D. Anderson Company #170, Crane 2611, or Kunckle 11 Series.
- K. Flexible Connectors: Flexible pipe connectors shall be double arch, 125 psi, expansion joint with spring loaded control units. Mount controls units with rubber grommets. Install joints so that there is no torsion on the joints and so that it corrects no more than 1/8" of misalignment. laFavorite 9030, mason MFNC, Uniroyal 4140 or 4200, or Metra Shere by MetraFlex.
- L. Float Valve: Hydraulically operated, diaphragm type, cast iron body with bronze trim, 125 PSI, ANSI 1316.1, liquid level control, valve closing on rise. Clayton Model 124-01.
- M. Liquid Level Gauge: Electronic liquid level gauging system consisting of sensor transmitted float with magnet and remote readout indicator, Model 714, calibrated in gallons.
1. Sensor/transmitter shall be FM approved with an accuracy of 1-1/2% of full scale. Hersey UR-2.

2.03 ACCESS PANELS:

- A. Plaster Ceiling: Inryco (Milcor) Style K or approved equal.
- B. Drywall Surface and Masonry Walls: Inryco (Milcor) Style DW, or approved equal. Style K for regular or cement plaster.
- C. Fire Rated Surfaces: Inryco (Milcor) U.L. fire rated door, or approved equal.
- D. All panels shall be factory painted with one coat of zinc chromate primer and with flush type metal cam lock.

PART 3.EXECUTION

3.01INSTALLATION:

- A. Strainers: Shall be full line size and shall have full size valves for servicing. Pipe valved blow-down to floor drain.
- B. Plumbers tape, straps, chain, wire hangers, or perforated bars are not permissible for hanging pipe.
- C. Provide access panels to valves, cleanouts and trap resealers, where concealed, for proper operation and maintenance of system.
- D. Provide black polyethylene pipe sleeve for copper pipe where it is run through or against masonry; or is run

SECTION 15430 – PIPING SPECIALTIES (PLUMBING)
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

through metal studs.

- E. All nuts to be locked tight by a second jamb nut on all types of hangers.

END OF SECTION

SECTION 15450 – WATER SUPPLY SYSTEM
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

1.02 PRODUCT HANDLING:

- A. Protect all equipment and materials from weather during storage and installation.

PART 2.PRODUCTS

2.01 MATERIALS:

- A. Provide piping valves, and specialties as specified under Section 15410, 15420 and 15430 of this Division.

2.02 DOMESTIC WATER PUMP SYSTEM:

- A. Provide factory assembled Grundfos duplex, vertical, multi-stage, centrifugal, constant pressure booster system, complete with pumps, accessories and controls, including valves, wiring, interconnecting piping, gauges, control panel mounted on a common steel base. Characteristics as shown on plans. The head rating shall include PRV and piping losses of the assembly.
- B. Pump: The pump suction/discharge chamber, motor stool and pump shaft coupling shall be constructed of cast iron. The impellers, pump shaft, diffuser chambers, outer discharge sleeve and impeller seal rings or seal ring retainers shall be constructed of stainless steel. The impellers shall be secured directly to the pump shaft by means of a stainless steel tapered split cone and locking nut or by a splined shaft arrangement. Intermediate and lower shaft bearings shall be bronze or tungsten carbide and ceramic. Pumps shall be equipped with a high temperature mechanical seal assembly with tungsten carbide seal faces mounted in stainless steel seal components.
- C. Motor: The pump motor shall be sized to insure the pump is non-overloading when operating on the specified pump curve. The motor shall be of the horsepower, voltage, phase and cycle as shown on the drawings. Motor design shall be of the open drip proof, with a NEMA C face design operating at a nominal 3450 RPM with a minimum service factor of 1.15. Lower motor bearings shall be adequately sized to insure long motor life. The motors shall be vertical, NEMA type JM, close coupled.
- D. Piping and Valves: System shall be skid mounted, completely assembled and wired on a formed steel base ready for installation. All piping shall be copper. Each system shall include suction and discharge gate valves for each pump. Combination pressure reducing/check valves of Bailey Model 30CS shall be used on the discharge of each main pump. Valve shall require only one adjustment to increase or decrease downstream pressure and shall be of the spring regulator type. Individual suction and discharge header shall have flanged connections. Suction and discharge gauges shall be provided. gauges shall have 3-1/2" faces with large scale numerals and individual air bleed type valves.
- E. Pumps: Pumps shall be Grundfos Series CR-U Model, vertically mounted end suction pumps. Pump BHP shall not exceed the motor service factor at any point on the operating curve.
- F. Diaphragm Tank: As part of the provided equipment, the manufacturer shall supply diaphragm tank to be compatible with booster system. Tank shall have a storage capacity and shall be installed as shown on drawings. Tank shall be ASME stamped and painted for salt air environment. Paint coat with an epoxy primer and finish with 2 coats of polyurethane.
- G. Control Panel:

SECTION 15450 – WATER SUPPLY SYSTEM

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR PHASE II RENOVATION AT 19A – 20 KONGENS GADE ST. THOMAS, U. S. VIRGIN ISLANDS

1. The control system shall add and subtract pumps as water usage changes in the building. A Jockey pump will maintain water pressure and storage in the tank during the periods of minimum water usage. A jockey pump pressure switch will start the jockey pump as system pressure falls and stop it when the water system is returned to the desired pressure. If the jockey pump cannot maintain system pressure, after a time delay, the main pumps are started in sequence with an automatic switch provided to select the lead pump. The lead pump shall be started by the system pressure switch and stopped after a minimum running time. If the lead pump cannot maintain system pressure, after a time delay, the lag pump will start and then stop after a minimum running time. Four timers shall be provided for (1) lead pump delay on, (2) lead pump minimum run time, (3) lag pump delay on, and (4) lag pump minimum run time. Timers shall be all solid state with line surge protection and maximum reset time of fifty milli-seconds.
 2. Provide auxiliary terminals and relays which allow one pump only to operate on "Emergency" power. Relay shall be normally open and shall be powered by external "normal" power circuit.
 3. Low system pressure visual alarm with pump shut-off at 10 psig shall be provided.
 4. The control panel shall be equipped with a main disconnect with door handle. Branch fuses, magnetic starter and HOA switch shall be furnished for each motor. Controls shall be 115 volt with control transformer.
- H. Testing: The entire system shall be hydraulically tested at the factory to assure proper sequencing to meet the design flows and pressures; and the system components shall be adjusted at the factory. Test shall include fill of pneumatic tank and shutdown.

PART 3.EXECUTION

3.01 PIPING:

- A. Shock Absorbers shall be installed on each fixture or group of fixtures and at the end of supply lines to prevent water hammer in pipes, whether or not they are shown on the plans. Shock absorbers shall be sized as per Standard PDI-WH-201
- B. Valves: Provide valves to isolate each cold water riser and branch line and each group of fixtures within a room.
- C. Provide stops at each fixture and piece of equipment.
 1. Integral stops on service sinks, tub/shower, etc.
 2. Supply with stop on lavatories, sinks, etc.
 3. Gate or ball valves on HB's and equipment.
- D. Horizontal runs in cold and hot water piping shall be graded slightly toward the lowest outlet and any one branch or riser. Swing connections to hot water mains.
- E. Provide Consolidated Kinetics type SFH spring hangers for piping a minimum of 100 pipe diameters downstream of house pumps and all piping within Equipment Room.
- F. Provide access panels for all concealed valves, controls and trap primers.
- G. Equipment Connections:
 1. Make connections between any piece of equipment and piping system in this section of the specifications by means of unions, flange joints or other fittings which permit equipment to be disconnected and removed for maintenance.
 2. Install valves or cocks in supply lines to each piece of equipment on supply side of union connections.

3.02 PUMP INSTALLATION:

SECTION 15450 – WATER SUPPLY SYSTEM

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

- A. Mount house pump system on Consolidated Kinetics type FDS unhoused spring isolators with 1-3/4" deflection and with neoprene pads.
- B. Support piping independently of pump or flexible connection. Alignment of flexible couplings shall be checked after pump is mounted and piped. Reducers on pump suction shall be eccentric. Pipe drip pockets or lips to nearest floor drain.

3.03 TESTS:

- A. Apply a water pressure test to all parts of the water supply system before the piping is concealed and before fixtures and equipment are connected. Use a hydrostatic pressure of 125 PSIG, but not less than 150% of the systems working pressure, applied to the system for a period of four hours. There shall be no leaks at any point in the system at this pressure.
- B. Leave concealed work uncovered until required tests have been completed, but if necessary, make tests on portions of the work and those portions of the work may be concealed after being inspected and approved. Make repairs of defects that are discovered as a result of inspections or tests with new materials. Caulking of screwed joints, cracks or holes will not be accepted. Repeat tests after defects have been eliminated.

3.04 STERILIZATION:

- A. As soon as the water piping has been thoroughly flushed out, sterilize the lines by introducing into them a solution of calcium hypochlorite or chloride of lime. Open and close all valves while system is being chlorinated. After the sterilizing agent has been applied for 24-hours, test for residual chlorine at the ends of the lines. If less than 10 parts per million is indicated, repeat the process. When tests show at least 10 parts per million of residual chlorine, flush out the system until all traces of the chemical used are removed. Make necessary connections to sterilize piping.
- B. After sterilization as described above has been accomplished, initiate a bacteriological test with a testing laboratory approved by the Architect. Samples shall be taken at a minimum of two locations, one of which shall be at the tap furthest from the water entrance to the building. A certified test report of these tests indicating satisfactory coliform count, color and chlorine residual shall be presented to the Architect/Owner when the water supply piping system is substantially completed during construction. Another exact test shall be performed at the time of issuance of Certificate of Occupancy with another certified test report presented to the Architect/ Owner at the time.

END OF SECTION

SECTION 15455 – DRAINAGE SYSTEMS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1.GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

1.02 SYSTEMS:

- A. All Gravity Drains Systems including:
 - 1. Sanitary drain, waste and vent, storm.
 - 2. Air Conditioning condensate drains

PART 2.PRODUCTS

2.01 MATERIALS:

- A. Provide piping, valves and specialties as specified under Sections 15100, 15410, 15420 and 15430 of this Division.

2.02 DRAINS:

- A. As specified in Schedule or as noted on the plans.
- B. Drain shall be as manufactured by Josam, Wade or Zurn.
- C. All floor drains shall be resealed. Refer to Section 15430.

2.03 TRAPS:

- A. Self-cleaning. Trap each fixture separately unless other-wise specifically detailed.

2.04 VENT FLASHING:

- A. Furnish lead flashing or copper pitch pans for all piping through the roof. Installation is specified in another section of these specifications.

2.05 CLEANOUTS AND ACCESS COVERS:

- A. Floor, Finished Rooms: Cast iron, adjustable, cleanout, brass internal plug, nikaloy scoriated square cover plate, secured. Josam 56030-15-22.
- B. Exterior, Heavy Duty: Cast iron spigot outlet, brass internal plug, ductile iron scoriated heavy duty secured cover. Josam 56050-15-31. Mount in 18 X 18 X 4" concrete pad.
- C. Stack Base:
 - 1. For Block Walls: Cast iron "T" branch tee with bronze countersunk plug, stainless steel round access cover plate secured with countersunk screw. Josam 58790.
 - 2. For Plaster Wall: Cast iron "T" branch tee with bronze countersunk plug, cast brass round access cover with anchor lugs, satin cover secured with countersunk screw. Josam 58750.
 - 3. For Tile Walls: Cast iron "T" branch with bronze countersunk plug, cast brass square access cover with satin top, anchor lugs, cover plate secured with four screws. Josam 58770.

SECTION 15455 – DRAINAGE SYSTEMS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

4. Carpet: Adjustable, cast iron cleanout, bronze plug. Josam 56010-15-14-22.
5. Vinyl Floor: Cast iron adjustable floor cleanout, satin bronze top, recessed for tile. Josam 56030-12-15-22.
6. Wall Access: Satin finish nikaloy square frame and cover. Size to be 8-inches X 8-inches opening or larger as required.
7. Floor Unfinished Areas, at Ceilings: Josam 58500-20 cast iron cleanout for caulking into pipe hub with threaded countersunk plug.

PART 3.EXECUTION

3.01 PIPE INSTALLATION:

- A. Install horizontal piping within building to 1/8 inch per foot grade. Run horizontal vent lines to a minimum grade back to stacks and vertical lines as direct and free from bends as possible. Exception: 2" and 3" piping shall slope at 1/4" per foot.
- B. Run piping above any ceiling as high as building construction permits, except where otherwise indicated.
- C. Make connections between equipment furnished by others or under other Sections of the Specifications to the piping systems provided under this section of the specifications.
- D. Sanitary Vents shall extend at least 6" above roof except that vents shall extend 7 ft. above sun decks or pool decks and 3 ft. above any door, window or ventilating opening within 10 feet.
- E. Where space permits, all branch drains shall connect to the top half of the building drains.

3.02 CLEANOUTS:

- A. Cast brass, full pipe size up to 4 inch and at least half pipe size for larger pipes with 4 inch minimum. Ferrules shall conform in thickness to that of pipe and fittings specified. Threads for ferrules and plugs shall conform to ANSI Standards.
- B. Location: In horizontal lines not more than 50 feet apart; at changes in pipe direction greater than 45 degrees; at base of leaders, soil and waste stacks; in the building drain within 5 feet of the exterior wall and as indicated or required.
- C. Cleanouts which may be rodded both ways shall be used whenever possible. Cleanouts shall be brought up to grade or finish surfaces or accessible through panels with adequate clearance for rodding.

3.03 TESTS:

- A. Apply a water test to all parts of the drainage system, before the pipes are concealed or fixtures set in place. These tests may be applied in Sections. Close all openings to each system to be tested except the highest opening above the roof and fill the system with water up to the overflow points of this highest opening. Subject all parts of the system to not less than 10 feet of hydrostatic head except the uppermost 10 feet of the

SECTION 15455 – DRAINAGE SYSTEMS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

pipng directly below the opening. Leave the water in the system for not less than 30 minutes, after which time no leaks at any point or lowering of the water level at the overflow shall be visible.

- B. Leave concealed work uncovered until required tests have been completed, but if necessary, make tests on portions of the work and those portions of the work may be concealed after being inspected and approved. make repairs of defects that are discovered as a result of inspecting or tests with new materials. Caulking of screwed joints, cracks, or holes will not be accepted. Repeat tests after defects have been eliminated.
- C. Contractor shall advise Architect/Owner 48 hours before beginning tests indicated above and shall not begin such tests until a representative of the Architect/Owner is present. All tests shall be performed in the presence of this representative until satisfactory results are obtained. Contractor shall provide a letter certifying such tests have been satisfactorily complete with signature of the Contractor's Representative, date of test and signature of the Architect/Owner's Representative as witness.

END OF SECTION

SECTION 15460 – WATER HEATING SYSTEMS
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1 GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

1.02 PRODUCT HANDLING:

- A. Protect all materials and equipment from the weather during construction.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Provide piping valves, and specialties as specified in Sections 15410, (15420) and 15430 of this Division.

2.02 ELECTRIC WATER HEATERS:

- A. Automatic electric storage type, with required accessories and controls, single or double top and bottom heating elements. Characteristics as shown on plans.
- B. Tank shall be welded steel, glass lined, 300 PSI test pressure and 150 PSI working pressure, shall have magnesium anode, drain cock, and dip tube. Provide immersion heating elements with adjustable thermostat for each element with high temperature cut-off. Insulation shall comply with ASHRAE Standard 90, and shall have steel jacket with enamel flush.
- C. Heaters shall bear the ASHRAE and UL Label, and shall comply with the Florida Energy Code.
- D. KW ratings shall be for listed voltage. Dual element heaters shall be connected for non-simultaneous operation, unless otherwise shown on Water Heater Schedule.
- E. Guarantee five years minimum against defects in workmanship and materials. ;If found defective, replace with new heater at no cost to Owner.
- F. Heaters shall be as manufactured by Lochinvar, A.O. Smith, or Rudd.
- G. Accessories:
 - 1. Provide field or factory supplied plastic lined nipples equal to "Clearflow" by Perfection Corp.
 - 2. Provide aluminum or plastic (not PVC) catch pan where shown on plans.
 - 3. Provide Watts 100 XL P&T Valve. Pipe drain full size outside building and down to 6" above grade.
 - 4. Heaters shall have field or factory supplied heat traps.

2.03 WATER HEATER GUARANTEE:

- A. Five years minimum against defects in workmanship. If found defective, replace with new heater at no extra cost to Owner.

PART 3 EXECUTION

3.01 GENERAL:

- A. Piping, tests, and sterilization shall be as specified in Section 15450.

3.02 SYSTEM:

SECTION 15460 – WATER HEATING SYSTEMS

GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR

PHASE II RENOVATION AT 19A – 20 KONGENS GADE

ST. THOMAS, U. S. VIRGIN ISLANDS

- A. Provide interconnecting piping, valves and specialties as shown on plan. Pipe relief valve drain outside building.

END OF SECTION

SECTION 15499 – PLUMBING SYSTEMS INSULATION
GOVERNMENT OF THE U. S. VIRGIN ISLANDS: OFFICE OF THE GOVERNOR
PHASE II RENOVATION AT 19A – 20 KONGENS GADE
ST. THOMAS, U. S. VIRGIN ISLANDS

PART 1 GENERAL

1.01 SUBMITTALS:

- A. Manufacturer's data for review before any work is commenced.

1.02 PRODUCT HANDLING:

- A. Protect all materials from the weather during storage and installation.

PART 2 PRODUCTS

2.01 PIPING:

- A. Condensate: 3/4" thick foamed plastic with 25/50 flame spread and smoke density rating. Armstrong or Thermo-cel.
- B. Domestic hot water supply and return: 1" fiberglass pipe insulation with FRJ white laminated Kraft jacket. Laps stapled with flare type staples 3" on center.
- C. Rain Water Leaders sound proofing, 1" thick Fiberglas flexible blanket, fastened to pipe with flare type staples.

PART 3 EXECUTION

3.01 INSTALLATION:

- A. Install insulation in accordance with manufacturer's recommendations.
- B. No insulation is to be installed until the system has been tested and found free of all leaks.
- C. Install all materials in a neat and workmanlike manner with all joints and seams taped and coated.
- D. Protect all pipe insulation at hangers with galvanized sheet metal shields. Provide cellular glass insulation at all supports for hot water piping.
- E. Foamed plastic shall be slipped over pipe where possible. Where insulation must be slit, seal with adhesive and secure with plastic cable ties on 18" centers.

END OF SECTION

